

itself in the thin air. Of course Melbourne claimed that the chemicals exerted a great influence on the atmosphere and forced rain to come. Occasionally rain did come after one, two, or three days of a chemical performance, but equally often it did not come. The cases of apparent success published in his pamphlet of April, 1892, were attested by the signatures of innumerable citizens, but these attestations, although they generally state "we believe that Mr. Melbourne has done more than he promised, and has produced the rain," yet, in fact, simply amounted to a record of the fact that rain did follow within four days from the time of his setting to work, and that "we are unable to account for it in any other way." The pamphlets published by Melbourne and the free advertisement in the newspapers produced so great a popular demand for his services in the arid regions that it really was a paying investment to hire him to attend a local fair or to "operate" in any locality. The twenty-five cents admission fee to see the "operations" were sure to cover expenses. The Weather Bureau was often importuned for advice as to when he should be called to any given town, and whether the inhabitants would be justified in paying him his fee of several hundred dollars. Eventually, a prominent railroad, through its enterprising business manager, rigged up a car for his use, and during the years 1892-4 made it convenient for all the citizens on its lines of road to invoke the aid of "the rain producer." Of course there were numerous cases in which the operations were followed by rain; those who studied the Daily Weather Map could see at a glance that these rains accorded with the general weather conditions and had nothing to do with the rain-making operations. So long as frequent rains occurred, although they were natural and were predicted by the Weather Bureau on the basis of the weather map from day to day, yet, the farmers of Iowa, Kansas, and Nebraska, ignoring this fact, were sure to accredit all success to Mr. Melbourne. Apparently, it was at first a profitable enterprise for the railroad, whose general manager wrote to us as follows in August, 1894.

The expense of the efforts has, with very rare exceptions, been our own and borne by the company. If good has resulted, the company can claim the benefit of it, and if the conditions which followed the operations would have followed them naturally, no one has been deceived except the company, because, with one or two exceptions, it has paid the bill.

Since 1894 several imitators of Melbourne's methods have occasionally been heard from. In March, 1896, Mr. W. Hazenflug, of Yates Center, Kans., was said to have patented a rain-making device—"an especially constructed gun, 14 feet long, that discharged a moisture-producing substance to a height of 18 miles and produced a shower of from 3 to 5 inches of rain within twenty-four hours at a small cost of \$6.00." America is not alone in these matters; on October 23, 1893, a prominent scientific journal of France recorded that A. Baudouin ran up a kite to a height of 1,200 metres into a cloud and produced sprinkles of rain, and that he had often thus made it rain in Tunis, Africa.

During the last great drought in California, 1898-99, the citizens of one city authorized an extensive and expensive system of experiments by gases and by cannon, but were fortunately saved the necessity of actually wasting their money by the fact that an abundant rain fell naturally just before they were ready to begin their own operations.

Occasionally we still receive newspaper items reviving the old story that floods of rain were broken up by cannonading at Rome, or that rain was produced by cannonading in Italy, or that hailstorms were averted from a special vineyard that was protected by lightning rods while neighboring vineyards suffered. These are all repetitions of the same old myths or repetitions of useless experiments, and the intelligent reader may dismiss them as having no foundation. No mat-

ter how severely his land may be suffering from drought or flood, he should seek some other mode of relief and not waste his time and money in efforts to change the nature of the clouds or the atmosphere.

In letters lately received from a gentleman in Helix, Cal., the writer says:

I have a letter from a man in Kansas, who, during five years, made 200 experiments with the discharge of gases, and declares that in 90 per cent of the cases they were successful, and his statement is fully confirmed by the assistant general manager of the railroad that lent him a traveling car, and in fact, employed him. * * * Will you kindly specify what gases have been experimented with by the Government, and then I will tell you what he used. If you have thoroughly tested the same gas, then, of course, I can believe there is nothing in it. If not, then, I trust you will apply for the use of that \$5,000 that was repaid into the treasury, and have a thorough test made around San Diego. * * * The present winter threatens to be another dry one, and the orchardists are in despair—it means ruin to many. The water companies say if they have to pump again they will have to charge us 10 cents for 1,000 gallons instead of 5 cents as last year. * * * I only wish to be satisfied that you have entirely overlooked the tests I name (i. e. the method of the Kansas operator—Ed.) or I would give you the facts now, but your specialists having reported that *it can't be done*, are, in my opinion, biased, and will pooh-pooh every one else's tests. The man in question says he used 20 tons of chemicals; that although he failed in some places he succeeded in 90 per cent. Is it likely he would have gone on using 20 tons of chemicals at his own cost, if it was a dead failure? He has no motive to gain; he has made the recipe public, and why then should he lie about it? * * * The reason why nothing is heard of this man's success is obvious. As most people get all the rain they want the public does not concern itself about the matter.

The honest indignation of our correspondent at the supposed shabby official treatment of a man in Kansas who has thus greatly and generously benefited his countrymen can best be met by the above given public statement of the simple facts of the case as learned by the present writer at the time of their occurrence, and we publish them for the benefit and guidance of all. It is not necessary for the Weather Bureau to try Mr. Melbourne's chemicals. He himself and his railroad company did that for us to perfection. The full official statement of his results day by day during May, June, July, and August, 1892, are now before us, and justify the statement that rain followed when the weather conditions were favorable for rain and when the local Weather Bureau man, with the weather chart before him, would have predicted local rains, such as occur in the summer time, without any regard to the chemical operations. Moreover, our correspondent may rest assured that the twenty tons of chemicals and other expenses were paid for by the railroad company, as shown by the above quotation from the letter of the general manager, probably until it was found that the company was losing too much money by the operation, and perhaps also a little self respect in perpetuating the delusion.

We may add further that if the Kansas recipe of chemicals appropriate to the production of rain is known to our correspondent at Helix, and if he and his neighbors wish to try the experiment during the next season of drought, there is certainly no reason why they should not do so. It seems absolutely necessary that the experiment should be tried over and over again, generation after generation, in order to show its folly to those who can only be guided by their own personal experience

THE WEATHER MAKER.

In connection with the preceding, the Editor recalls the following passage in an interesting book by E. Gerard, published in New York in 1888, entitled *The Land beyond the Forest*, which gives an account of the natives of Transylvania. As many of those now living in the United States have emigrated from countries whose inhabitants still retain beliefs in these stories of the old world, it is not surprising that we

have among us those who readily believe in the old and the new errors that start up from time to time and with the help of the daily newspapers preserve a wandering existence like the will-o'-the-wisp.

My old village oracle told me many stories about a man she had known, who used to go about the country with a small black bag in which were a little book, a little stick, and a bunch of herbs. Whenever a storm was brewing he was to be seen standing on some rising piece of ground, and repeating his formulas against the gathering clouds. "People used to abuse him," she said, "and to say that he was in league with the devil; but I never saw him do any harm, and now that he is dead there are many who regret him, for since then we have had heavier hailstorms than ever were known in his time."

Instances of weather makers are also common in Germany. We are told that there used to live in Suabia long ago a pastor renowned for his proficiency in exorcising the weather, and whenever a thunderstorm came on he would stand at the open window invoking the clouds till they had all dispersed. But the work was heavy and difficult to do, and the pastor used frequently to be so exhausted after dispersing a storm that large drops of perspiration would trickle down his face.

We are also told that many years ago, in the village of Wermesch, there lived a peasant who, whenever a thunderstorm was seen approaching, used to take his stand in front of it armed with an axe, by which means he always turned the storm aside. One day, when an unusually heavy storm was seen approaching, the weather maker, as usual, placed himself in front of it, and hurled the axe up into the

clouds. The storm passed by, the axe did not fall down to the earth again. Many years later, the same peasant taking a journey farther into the land, entered the hut of a Wallachian, and there, to his astonishment, found the axe he had thrown into the thunderclouds several years previously. This Wallachian was a still greater sorcerer in weather making than the Wermesch peasant, and had therefore succeeded in getting the axe down again from the sky.

There are many old formulas and incantations bearing on this subject to be found in ancient chronicles, of which the following one bears a date of the sixteenth century:

Formula.—And the Lord went forth down a long and ancient road, and there was met by an exceeding large, black cloud; and the Lord spoke thus to it: "Where goest thou, thou large, black cloud? Where goest thou go?" Then spoke the cloud, "I am sent to do an injury to the poor men, to wash away the roots of his vines, and to overthrow the grapes." But the Lord spoke, "Turn back, turn back, thou big black cloud, and do not wander forth to do an injury to the poor man, but go to the wild forest and wash away the roots of the big oak tree and overthrow its leaves. Saint Peter, do thou draw thy sharp sword and cut in twain the big black cloud, that it may not go forth to do an injury to the poor men."

Underneath this incantation the writer has put the following memorandum: "Probatum an sit me latet probet quicunque vult."

In many houses it is still customary to burn juniper berries during a thunderstorm, or to stick a knife in the ground before the house. Like the Roumanian, the Saxon also considers it unsafe to point at an approaching thunderstorm; but this is a belief shared by many people, I understand.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

The month for the most part was warm and dry. Low temperatures prevailed east of the Rocky Mountains from the 1st to the 5th, but from that date until the 25th a number of lows, first appearing on the weather map over the North Pacific coast and the Southwest, respectively, moved across the country in rapid succession, giving abnormally warm weather in almost all districts. From the 25th until the end of the month several moderate cold waves moved southeastward from Assiniboia carrying the line of freezing temperature to the east Gulf coast and northern Florida on the 30th of the month.

The minimum temperatures of the month were generally recorded from the 1st to the 3d and from the 26th to the 31st. No very severe cold waves occurred.

The rainfall on the California coast was light and scattered after the 8th, and the month as a whole gave less than the normal amount.

The snowfall was light in all districts and quickly disappeared. Less than an inch fell during the entire month over probably two-thirds of the total area of the United States. At the end of the month there was no snow upon the ground east of the Rocky Mountains, except in the Ohio Valley, the Lake region, New England, and a portion of the Middle States.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV, and the numerical values are given in Tables I and II.

In connection with the pressure distribution for the current month it is to be noticed that a ridge of high pressure extends from eastern Tennessee to eastern Oregon and Washington. This type of pressure distribution is generally contemporary with dry weather east of the Rocky Mountains. As compared with the preceding month, pressure fell in the majority of districts.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	35.8	+ 2.1	.....	.....
Middle Atlantic	12	34.7	+ 2.2	.....	.....
South Atlantic	10	46.3	— 0.2	.....	.....
Florida Peninsula	7	57.9	— 2.2	.....	.....
East Gulf	7	48.8	— 1.0	.....	.....
West Gulf	7	50.0	+ 3.4	.....	.....
Ohio Valley and Tennessee	12	37.1	+ 2.8	.....	.....
Lower Lake	8	28.6	+ 3.2	.....	.....
Upper Lake	9	24.2	+ 6.6	.....	.....
North Dakota	7	17.0	+14.6	.....	.....
Upper Mississippi Valley	11	20.2	+ 8.2	.....	.....
Missouri Valley	10	30.3	+10.1	.....	.....
Northern Slope	7	30.2	+13.5	.....	.....
Middle Slope	6	36.8	+ 8.8	.....	.....
Southern Slope	6	43.3	+ 6.4	.....	.....
Southern Plateau	13	42.8	+ 6.7	.....	.....
Middle Plateau	9	31.6	+ 8.1	.....	.....
Northern Plateau	10	34.5	+10.0	.....	.....
North Pacific	9	43.1	+ 4.5	.....	.....
Middle Pacific	5	49.8	+ 2.7	.....	.....
South Pacific	4	54.6	+ 4.0	.....	.....

Temperature was markedly above normal in all districts save the South Atlantic States and Florida. The average excess ranged from about 15° daily in Montana and North Dakota to less than 1° in southeastern Tennessee and about 3° on the Pacific coast. The monthly means ranged from about 12° in northern Minnesota to 50° and over in southern